CLAIMS:

1. A method for controlling communications access between a hub and a plurality of distributed stations over a medium, the method comprising the steps of:

(a) allocating a plurality of channels for data communications between the stations and the hub, the number of channels being at least equal to the number of stations, and each station owning at least one channel, each channel being varyingly in one of an empty-, a reserved-, or an owner-state, and whereby:

(i) the empty-state provides a channel to which any station can have access;

(ii) the reserved-state provides a channel to which a station having made a reservation with the hub, but not owning the channel, can have access; and

(iii) the owner-state provides a channel to which only the owning station has access; and

(b) re-allocating the respective state and/or the number of channels over time on the basis of each station's data requirements.

2. A method as claimed in claim 1, wherein the data communication is over a medium having finite bandwidth.

3. A method as claimed in claim 1 ~~or claim 2~~, wherein there are at least as many channels in the owner-state as there are stations.

4. A method as claimed in ~~any one of the preceding~~ claims comprising the further step of a station at any time requesting of the hub to be allocated one or more extra channels.

5. A method as claimed in ~~any one of the preceding~~ claims, whereby a channel further provides for management traffic between each station and the hub, and comprises the further step, as management traffic, of a station negotiating with the hub to be allocated a required number of channels in the owner-state.

6. A method as claimed in claim 5, comprising the further step of a station negotiating with the hub to be allocated a required number of channels in the reserved-state.

7. A method as claimed in ~~either one of~~ claims 5 ~~or 6~~, comprising the further steps of a station requesting an indication of the number of stations seeking to

register, and the hub responding thereto, wherein said station receives said indication by request and indication.

8. A method as claimed in ~~either one of~~ claim~~s~~ 5 ~~or 6,~~ comprising the further steps of a station requesting an indication of the number of stations seeking to register, and the hub responding thereto, wherein said station receives said indication by broadcast.

9. A method as claimed in ~~any one of~~ claim~~s~~ 5 ~~to 8~~, comprising the further steps of a station requesting an indication of the number of stations seeking to use a channel and the hub responding thereto, whereby said station receives said indication by request and indication.

10. A method as claimed in ~~any one of~~ claim~~s~~ 5 ~~to 8,~~ comprising the further steps of a station requesting an indication of the number of stations seeking to use a channel and the hub responding thereto, whereby said station receives said indication by broadcast.

11. A method as claimed in ~~any one of~~ claim~~s~~ 5 ~~to 10~~, comprising the further step of a station requesting the hub to be deregistered to give-up allocated channels.

12. A method as claimed in ~~any of~~ claim~~s~~ 5 ~~to 10~~, comprising the further step of a station requesting the hub to delay any data communication to the station for a period of time to be in a sleep mode.

13. A method as claimed in ~~any one of the preceding~~ claim~~s~~ 1, whereby the step of re-allocation includes the step of temporarily ascribing use of reserved-state channel to a non-owning station.

14. A method as claimed in claim 13, whereby said temporary use is rescinded following lapse of a time period of no use by the ascribed station.

15. A method as claimed in ~~either one of~~ claim~~s~~ 13 ~~12 or 13,~~ whereby the owning station of said reserved-state channel resumes use on demand.

16. A method as claimed in ~~any one of the preceding~~ claim~~s~~ 1, whereby each said channel comprises a plurality of slots and each slot comprises a data unit of varying length, and wherein each channel has either hub-to-mobile slots or mobile-to-

hub slots, and comprising the further step of the length of hub-to-mobile slots being arranged to be different from the length of the mobile-to-hub slots.

17. A method as claimed in claim 16, whereby the length of said hub-to-mobile slots is different from the length of said mobile-to-hub slots, and comprising the further step of the length of the slots being varied to account for different traffic conditions.

18. A method as claimed in claim 17, whereby in the slot length varying step, the hub is configured to replace a mobile-to-hub slot with a hub-to-mobile slot to account for different traffic conditions.

19. A method for controlling communications access between a hub and a plurality of mobile stations via a plurality of channels providing data access therebetween, there being at least as many channels as mobile stations, and the channels being varyingly in one of an empty-, a reserved-, or an owner-state, and whereby:

(i) the empty-state provides a channel to which any station can have access;

(ii) the reserved-state provides a channel to which a station having made a reservation with the hub, but not owning the channel, can have access; and

(iii) the owner-state provides a channel to which only the owning station has access;

the method comprising the steps of re-allocating the respective state and/or the number of channels over time on the basis of each station's data requirements.

20. A method as claimed in claim 19, wherein the data communication is over a medium having finite bandwidth.

21. A method as claimed in ~~either one of~~ claims 19 ~~or 20~~, whereby a channel further provides for management traffic between each station and the hub, and comprises the further step, as management traffic, of a station negotiating with the hub to be allocated a required number of channels in the owner-state.

22. A method as claimed in ~~any one of~~ claims 19 ~~to 21~~, wherein the medium is free space.

23. A method as claimed in ~~any one of~~ claims 19 ~~to 22~~, comprising the further step of a station negotiating with the hub to be allocated a required number of channels in the reserved state.

24. A method as claimed in ~~any one of~~ claims 19 ~~to 22~~, comprising the further steps of a station requesting an indication of the number of stations seeking to register, and the hub responding thereto, wherein said station receives said indication by request and indication.

25. A method as claimed in ~~any one of~~ claims 19 ~~to 23~~, comprising the further steps of a station requesting an indication of the number of stations seeking to register, and the hub responding thereto, wherein said station receives said indication by broadcast.

26. A method as claimed in ~~any one of~~ claims 19 ~~to 25~~, comprising the further steps of a station requesting an indication of the number of stations seeking to use a channel, and the hub responding thereto, wherein said station receives said indication by request and indication.

27. A method as claimed in ~~any one of~~ claims 19 ~~to 25~~, comprising the further steps of a station requesting an indication of the number of stations seeking to use a channel, and the hub responding thereto, wherein said station receives said indication by broadcast.

28. A method as claimed in ~~any one of~~ claims 19 ~~to 27~~, comprising the further step of a station requesting the hub to be deregistered to give-up allocated channels.

29. A method as claimed in ~~any one of~~ claims 19 ~~to 28~~, comprising the further step of a station requesting the hub to delay any data communications to the station for a period of time to be in a step mode.

30. A method as claimed in ~~any one of~~ claims 19 ~~to 29~~, whereby the step of reallocation includes the step of temporarily ascribing use of reserved-state channel to a non-owning station.

31. A method as claimed in claim 30, whereby said temporary use is rescinded following lapse of a time period of no use by the ascribed station.

32. A method as claimed in ~~either one of~~ claims 30 ~~or 31~~, whereby the owning station of said reserved-state channel resumes use on demand.

33. A method as claimed in ~~any one of~~ claims 19 ~~to 32~~, whereby each said channel comprises a plurality of slots and each slot comprises a data unit of varying length, and wherein each channel has either hub-to-mobile slots or mobile-to-hub slots, and comprising the further step of the length of hub-to-mobile slots being arranged to be different from the length of the mobile-to-hub slots.

34. A method as claimed in claim 33, whereby the length of said hub-to-mobile slots is different from the length of said mobile-to-hub slots, and comprising the further step of the length of the slots being varied to account for different traffic conditions.

35. A method as claimed in claim 34, whereby in the slot length varying step, the hub is configured to replace a mobile-to-hub slot with a hub-to-mobile slot to account for different traffic conditions.

36. A communications system having controlled data access to a medium, the system comprising:

a hub having transceiving means for communication via the medium and data processing means;

a plurality of distributed stations, each having transceiving means for communication with the hub via the medium and data processing means;

and wherein said data processing means of the hub and the stations co-operate to allocate a plurality of channels for data communications between the stations and the hub, the number of channels being at least equal to the number of stations, and each station owning at least one channel, each channel being varyingly in one of an empty-, a reserved-, or an owner-state, and wherein:

(i) the empty-state provides a channel to which any station can have access,

(ii) the reserved-state provides a channel to which a station having made a reservation with the hub, but not owning the channel, can have access, and

(iii) the owner-state provides a channel to which only the owning station has access,

and co-operate to re-allocate the respective state and/or the number of channels over time on the basis of each station's data requirements.

37. A system as claimed in claim 36, wherein the stations are mobile and the medium is free space.

a 38. A system as claimed in ~~either one of~~ claims 36 ~~or 37~~, wherein the data communications is over a medium having finite bandwidth.

a 39. A system as claimed in ~~any one of~~ claims 36 ~~to 38~~, wherein there are at least as many channels in the owner-state as there are stations.

a 40. A system as claimed in ~~any one of~~ claims 36 ~~to 39~~, wherein a station data processing means, at any time, requests from the hub data processing means to be allocated one or more extra channels.

a 41. A system as claimed in ~~any one of~~ claims 36 ~~to 40~~, wherein the hub data processing means further provides for management traffic between each station and the hub, and the management traffic includes a station negotiating with the hub to be allocated a required number of channels in the owner-state.

42. A system as claimed in claim 41, wherein a station data processing means negotiates with the hub data processing means to be allocated a required number of channels in the reserved-state.

a 43. A system as claimed ~~either one of in~~ claims 41 ~~or 42~~, wherein a station data processing means requests an indication of the number of stations seeking to register, and the hub data processing means responds thereto, and wherein said station receives said indication by request and indication.

a 44. A system as claimed ~~either one of in~~ claims 41 ~~or 42~~, wherein a station data processing means requests an indication of the number of stations seeking to register, and the hub data processing means responds thereto, and wherein said station receives said indication by broadcast.

a 45. A system as claimed in ~~any one of~~ claims 41 ~~to 44~~, wherein a station data processing means requests an indication of the number of stations seeking to use a channel and the hub responding thereto, and wherein said station receives said indication by request and indication.

a 46. A system as claimed in ~~any one of~~ claims 41 ~~to 43~~, wherein a station data processing means requests an indication of the number of stations seeking to use a channel and the hub responding thereto, and wherein said station receives said indication by broadcast.

47. A system as claimed in ~~any one of~~ claims 41 ~~to 46~~, wherein a station data processing means requests the hub data processing means to be deregistered to give-up allocated channels.

48. A system as claimed in ~~any one of~~ claims 41 ~~to 47~~, wherein a station data processing means requests the hub data processing means to delay any data communication to the station for a period of time to be in a sleep mode.

49. A system as claimed in ~~any one of~~ claims 36 ~~to 48~~, wherein re-allocation includes temporarily ascribing use of reserved-state channel to a non-owning station.

50. A system as claimed in claim 49, wherein said temporary use is rescinded following lapse of a time period of no use by the ascribed station.

51. A system as claimed in ~~either one of~~ claims 49 ~~or 50,~~ wherein the owning station of said reserved-state channel resumes use on demand.

52. A system as claimed in ~~any one of~~ claims 36 ~~to 51,~~ whereby each said channel comprises a plurality of slots.

53. A system as claimed in claim 52, whereby each slot comprises a data unit of varying length.

54. A system as claimed in ~~either one of~~ claims 52 ~~or 53~~, whereby each channel comprises either hub-to mobile slots or mobile-to-hub slots.

55. A system as claimed in claim 54, whereby the length of said hub-to-mobile slots is different from the length of said mobile-to-hub slots.

56. A system as claimed in ~~any one of~~ claims 52 ~~to 54,~~ whereby the length of said slots varies to account for different traffic conditions.

57. A system as claimed in ~~any one of~~ claims 52 ~~to 56,~~ whereby the hub is configured to replace a mobile-to-hub slot with a hub-to-mobile slot to account for different traffic conditions.

58. A hub for a communications system, operable to have controlled data access to a medium in co-operation with a plurality of distributed stations, the hub comprising:

transceiving means for communications via the medium; and

data processing means coupled to the transceiving means;

and wherein said data processing means of the hub is operable to allocate a plurality of channels for data traffic between the stations and the hub, the number of channels being at least equal to the number of stations, each channel being varyingly in one of an empty-, a reserved-, or an owner-state, and wherein:

(i) the empty-state provides a channel to which any station can have access,

(ii) the reserved-state provides a channel to which a station having made a reservation with the hub, but not owning the channel, can have access, and

(iii) the owner-state provides a channel to which only the owning station has access,

and further operable to re-allocate the respective state and/or the number of channels over time on the basis of each station's data requirements.

59. A hub as claimed in claim 58, wherein the stations are mobile and the medium is free space.

60. A hub as claimed in ~~either one of~~ claims 58 ~~or 59,~~ wherein the data communications is over a medium having finite bandwidth.

61. A hub as claimed in ~~any one of~~ claims 58 ~~to 60,~~ wherein there are at least as many channels in the owner state as there are stations.

62. A hub as claimed in ~~any one of~~ claims 58 ~~to 61,~~ wherein a station data processing means, at any time, requires from the hub data processing means to be allocated one or more extra channels.

63. A hub as claimed in ~~any one of~~ claims 58 ~~to 62,~~ wherein the hub data processing means further provides for management traffic between each station and the hub, and the management traffic includes a station negotiating with the hub to be allocated a required number of channels in the owner-state.

64. A hub as claimed in ~~any one of~~ claims 58 ~~to 63,~~ wherein a station processing means negotiates with the hub data processing means to be allocated a required number of channels in the reserved-state.

65. A hub as claimed in claim 63 ~~or 64~~, wherein a station data processing means requests an indication of the number of stations seeking to register, and the hub data processing means responds thereto, and wherein said station receives said indication by request and indication.

66. A hub as claimed in claim 63 ~~or 64~~, wherein a station data processing means requests an indication of the number of stations seeking to register, and the hub data processing means responds thereto and wherein said station receives said indication by broadcast.

67. A hub as claimed in ~~any one of~~ claims 63 ~~to 66~~, wherein a station data processing means requests an indication of the number of stations seeking to use a channel, and the hub responding thereto, and wherein said station receives said indication by request and indication.

68. A hub as claimed in ~~any one of~~ claims 63 ~~to 66~~, wherein a station data processing means requests an indication of the number of stations seeking to use a channel, and the hub responding thereto, and wherein said station receives said indication by broadcast.

69. A hub as claimed in ~~any one of~~ claims 63 ~~to 67~~, wherein a station data processing means requests the hub data processing means to be deregistered to give up allocated channels.

70. A hub as claimed in ~~any one of~~ claims 63 ~~to 69~~, wherein a station data processing means requires the hub data processing means to delay any data communication to the station for a period of time to be in a sleep mode.

71. A hub as claimed in ~~any one of~~ claims 58 ~~59 to 70~~, wherein re-allocation includes a temporarily ascribing use of reserved-state channel to a non-owning station.

72. A hub as claimed in claim 71, wherein said temporary use is rescinded following laps of a time period of no use by the ascribed station.

73. A hub as claimed in ~~either one of~~ claims 71 ~~or 72~~, wherein the owning station of said reserved-state channel resumes use on demand.

74. A method as claimed in ~~any one of~~ claims 58 ~~to 73~~, whereby each said channel comprises a plurality of slots.

75. A hub as claimed in claim 74, whereby each slot comprises a data unit of varying length.

76. A hub as claimed in ~~either one of~~ claims 74 ~~or 75~~, whereby each slot is owned by a station.

77. A hub as claimed in ~~any one of~~ claims 74 ~~to 76~~, whereby each channel comprises either hub to mobile slots or mobile to hub slots.

78. A hub as claimed in claim 77, whereby the length of said hub-to-mobile slots is different from the length of said mobile-to hub-slots.

79. A hub as claimed in ~~any one of~~ claims 74 ~~to 78~~, whereby the length of said slots varies to account for different traffic conditions.

80. A hub as claimed in ~~any one of~~ claims 77 ~~to 79~~, whereby the hub is configured to replace a mobile-to-hub slot with a hub-to-mobile slot to account for different traffic conditions.

81. A wireless local area network having a medium access protocol to control access, the network comprising:

a hub having transceiving means for communication via free space paths and data processing means;

a plurality of distributed stations, each having transceiving means for communication with the hub via free space paths and data processing means;

and wherein said data processing means of the hub and the stations co-operate to allocate a plurality of channels for data traffic between the stations and the hub, the number of channels being at least equal to the number of stations, and each station owning at least one channel, each channel being varyingly in one of an empty-, a reserved-, or an owner-state, and wherein:

(i) the empty-state provides a channel to which any station can have access,

(ii) the reserved-state provides a channel to which a station having made a reservation with the hub, but not owning the channel, can have access, and

(iii) the owner-state provides a channel to which only the owning station has access,

and co-operate to re-allocate the respective state and/or the number of channels over time on the basis of each station's data requirements.

82. A wireless local area network as claimed in claim 81, wherein the stations are mobile and the medium is free space.

83. A wireless local area network as claimed in ~~either one of~~ claims 81 ~~or~~ ~~82~~, wherein the data communications is over a medium having finite bandwidth.

84. A wireless local area network as claimed in ~~any one of~~ claims 81 ~~to~~ ~~83~~, wherein there are at least as many channels in the owner state as there are stations.

85. A wireless local area network as claimed in ~~any one of~~ claims 81 ~~to~~ ~~84~~, wherein a station data processing means, at any time, requires from the hub data processing means to be allocated one or more extra channels.

86. A wireless local area network as claimed in ~~any one of~~ claims 81 ~~to~~ ~~85~~, wherein the hub data processing means further provides for management traffic between each station and the hub, and the management traffic includes a station negotiating with the hub to be allocated a required number of channels in the owner-state.

87. A wireless local area network as claimed in ~~any one of~~ claims 81 ~~to~~ ~~86~~, wherein a station processing means negotiates with the hub data processing means to be allocated a required number of channels in the reserved-state.

88. A wireless local area network as claimed in ~~either one of~~ claims 86 ~~or~~ ~~87~~, wherein a station data processing means requests an indication of the number of stations seeking to register, and the hub data processing means responds thereto, and wherein said station receives said indication by request and indication.

89. A wireless local area network as claimed in ~~either one of~~ claims 86 ~~or~~ ~~87~~, wherein a station data processing means requests an indication of the number of stations seeking to register, and the hub data processing means responds thereto, and wherein said station receives said indication by broadcast.

90. A wireless local area network as claimed in ~~any one of~~ claims 86 ~~to~~ ~~89~~, wherein a station data processing means requests an indication of the number of

stations seeking to use a channel, and the hub responding thereto, and wherein said station receives said indication by request and indication.

91. A wireless local area network as claimed in ~~any one of~~ claims 86 ~~to~~ ~~87~~, wherein a station data processing means requests an indication of the number of stations seeking to use a channel, and the hub responding thereto, and wherein said station receives said indication by broadcast.

92. A wireless local area network as claimed in ~~any one of~~ claims 86 ~~to~~ ~~90~~, wherein a station data processing means requests the hub data processing means to be deregistered to give up allocated channels.

93. A wireless local area network as claimed in ~~any one of~~ claims 86 ~~to~~ ~~92~~, wherein a station data processing means requires the hub data processing means to delay any data communication to the station for a period of time to be in a sleep mode.

94. A wireless local area network as claimed in ~~any one of~~ claims 86 ~~to~~ ~~93~~, wherein re-allocation includes a temporarily ascribing use of reserved-state channel to a non-owning station.

95. A wireless local area network as claimed in claim 94, wherein said temporary use is rescinded following laps of a time period of no use by the ascribed station.

96. A wireless local area network as claimed in ~~either one of~~ claims 94 ~~or~~ ~~95~~, wherein the owning station of said reserved-state channel resumes use on demand.

97. A wireless local area network as claimed in ~~any one of~~ claims 81 ~~to~~ ~~96~~, whereby each said channel comprises a plurality of slots.

98. A wireless local area network as claimed in claim 97, whereby each slot comprises a data unit of varying length.

99. A wireless local area network as claimed in ~~either one of~~ claims 97 ~~or~~ ~~98~~, whereby each channel comprises either hub-to-mobile slots or mobile-to-hub slots.

100. A wireless local area network as claimed in claim 99, whereby the length of said hub-to-mobile slots is different from the length of said mobile-to-hub slots.

101. A wireless local area network as claimed in ~~any one of~~ claims 97 ~~to 100,~~ whereby the length of said slots varies to account for different traffic conditions.

102. A wireless local area network as claimed in ~~any one of~~ claims 99 ~~to 101,~~ whereby the hub is configured to replace a mobile-to-hub slot with a hub-to-mobile slot to account for different traffic conditions.